

SCIENCE

And Technology Program



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This research is intended to help define the relationship between the sources of trace elements, in particular selenium, and targeted habitats. Water resource projects throughout Reclamation are concerned with reducing water quality impacts of water resource projects, including toxicants in irrigation return flows. However, the relationship between trace elements such as selenium, present in irrigation waters and soils, and soluble selenium in drainage return flows is poorly understood. No reliable methods exist to interpret soil and substrata selenium data for use in predicting return flow concentrations on existing or proposed water resource projects. The result is highly conservative. Worst-case standards are often imposed on projects. It is becoming increasingly important to be able to make these technical decisions on models that have been field tested and have a verifiable basis.

The goal is to evaluate and improve predictive methods for shallow ground water transport modeling of selenium. The study team will evaluate field sampling methods, laboratory techniques to more accurately predict field leaching conditions, and transport models for predicting timing of water quality to drain outlets. The characterization and relationship of the occurrence and transport of selenium within and through the soil profile to the irrigation return flows is the overall objective of the project.

The study team has coordinated field activities with the ongoing DOI Irrigation and Drainage Program sites and continued to meet with the Gunnison River Basin Selenium Taskforce (GRBST) in Montrose, Colorado. Some field soil and drain water samples have been collected with the cooperation of the NRCS, USGS, and other members of this task force who have provided in-kind services, as well as equipment. The study team has provided oversight of laboratory work with the USGS and has provided technical analyses in cooperation with DOI-IDP for soil analyses. In cooperation with the GRBST field studies, seven intelligent multi-parameter monitoring probes have been purchased.